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Athabasca Oil Sands of Alberta, Canada.
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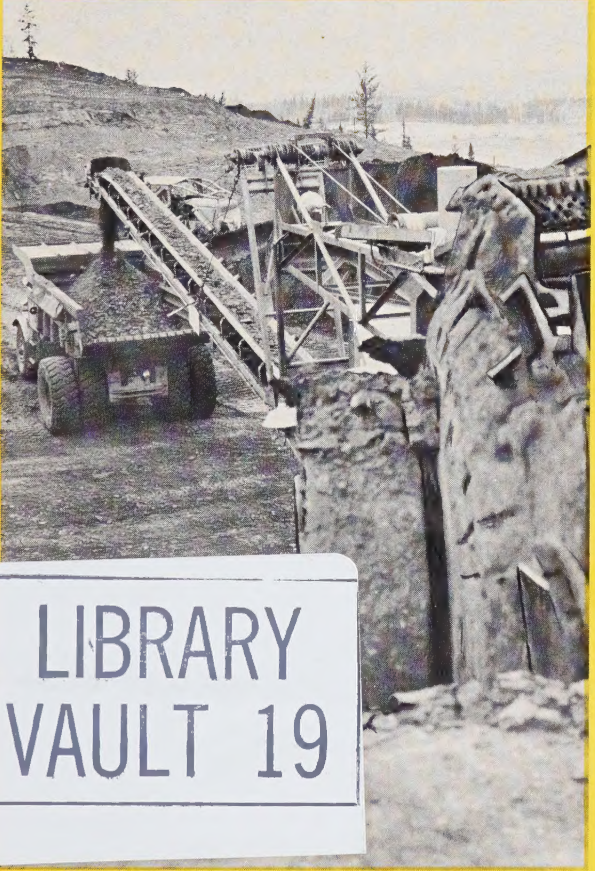

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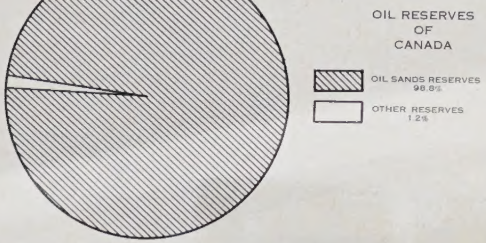
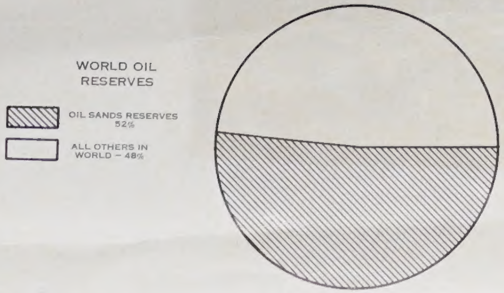
Oil-laden sand, strip-mined by a bucket-wheel excavator, is being loaded in a truck for conveyance to the pilot plant for separation. Note the black, oily consistency of the sands.

When construction began last summer on a plant to extract oil from the fabulous Athabasca oil sands of north-eastern Alberta, it was the culmination of almost two centuries of planning, scheming and research.

In 1778 Peter Pond, an American fur trader for the Northwest Company, reached the junction of the Athabasca and Clearwater rivers, where the town of Fort McMurray now stands. Here, he found the Indians using the sticky substance which was oozing from the river banks to waterproof their canoes.

However, it was a century later before the Geological Survey of Canada instituted plans for a survey of the area. This survey revealed that the oil sands, extending for 118 miles along the Athabasca River, cover an area of approximately 13,000 square miles. It has since been estimated that, excluding oil from shale, the Athabasca reserves are greater than any other in the world—larger than the oil reserves of the Middle East and South America.





An aerial photo of the site of the oilsands separation plant near Fort McMurray, Alberta. In the foreground, on the shore of the Athabasca River, is the pilot plant at which preliminary research is being carried out.

There are an estimated 626 billion barrels of reserves in place, with recoverable reserves of raw oilsand oil in the area amounting to 369 billion barrels. This is approximately 52% of the world's oil reserves.

In comparison, only 20.2 billion barrels of conventional oil, or 5.5 billion barrels of conventional recoverable oil, has been found to date in all the rest of Alberta. One lease alone in the Athabasca oil sands area, consisting of 3,800 acres, has been estimated to hold some 650 million barrels of recoverable oil, enough to last 40 years at the present authorized rate of production. The oil sands are estimated to contain 98.8% of Canada's oil reserves, and 99% of the known reserves of the province of Alberta.

While this oil-bearing sand is found near the surface and readily strip-mined like a mineral, the problem of extraction has long proved a stumbling block in actual production. Over the years many private companies, the Federal Mines Branch, and the National Research Council, all attempted a variety of recovery processes. These included a centrifugal method, the use of ultra-sonic waves, and the injection of hot air and natural gas. The use of high voltage electricity to heat the oil, and the detonation of a nuclear device below the sand have also been considered.

It remained for the Research Council of Alberta, and in particular Dr. Karl A. Clark, a pioneer in oil sands development since 1922, to develop a hot water process which has proved to be the most successful to date.

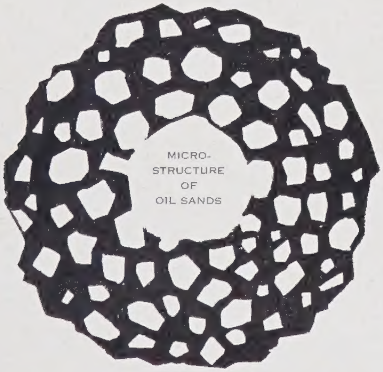
The plant which is now under construction will use giant bucket-wheel excavators to recover the raw oil sands by strip mining at rates of up to 100,000 tons of oil sands per day. A conveyor belt system will move the oil sands to the separation plant where the sand and bitumin will be separated by the hot water process.

View at the head of the inclined tailings screw of the separation cell. Water and oil froth, lifted along with sand tailings, run back into the separation cell through the divider between the two screws.

In the separation plant the sand is mixed with steam and hot water to form a thick slurry. The slurry is sent to a separation cell, where the oil floats to the top as froth, while the heavy sands sink to the bottom of the water and are carried away. The oil froth is skimmed off the top by revolving wiper blades which look like king-sized windshield wipers.

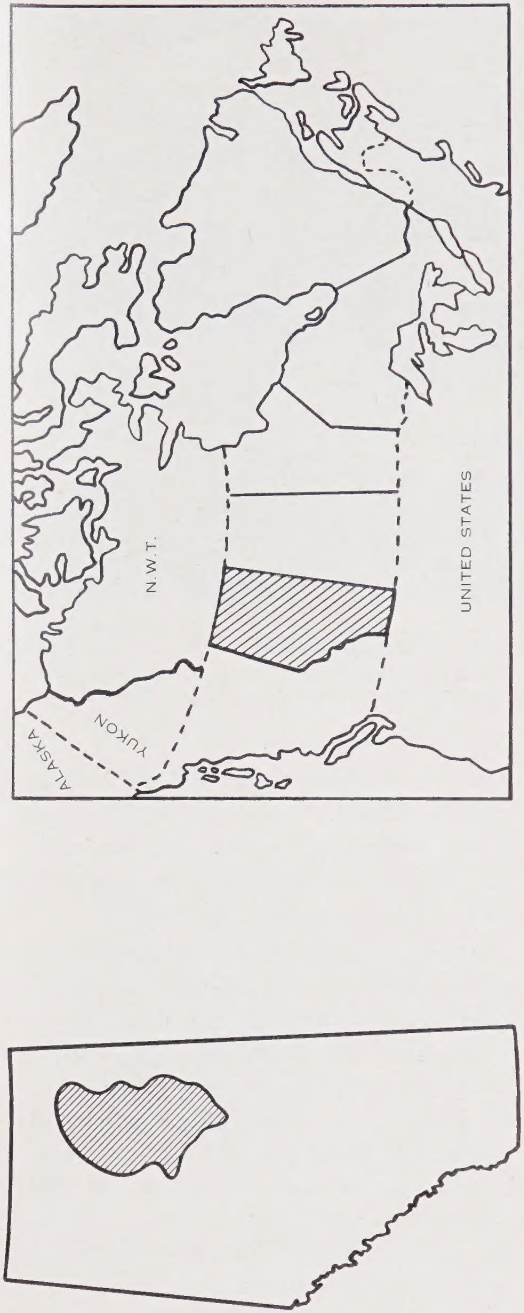
From the separation plant, the recovered oil will move to the de-hydration and de-aeration plant where the last of the sand, water and air will be removed. The final product will be a synthetic crude oil which is fluid enough to be carried through pipelines. This will be produced at the rate of 45,000 barrels per day—a figure established by the Oil and Gas Conservation Board of Alberta.

The town of Fort McMurray, on the edge of the vast oil sands area of northeastern Alberta, has become the centre of an industrial boom. Construction of the new plant, and of facilities to accommodate the influx of population, has provided new employment for residents of the area and, once the new plant is in operation, its payroll will maintain the increased economy of the community.



Oil of the Athabasca Oil Sands occupies the spaces between the grains of sand, just as in other oilfields, it occupies the spaces between layers of rock or shale.

WARNING—The National Employment Service of Canada warns against seeking employment at Fort McMurray other than through their offices. There is now a surfeit of workers on hand.



LOCATION AND APPROXIMATE AREA OF THE ATHABASCA OIL SANDS IN ALBERTA.

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